Flood defence in a wider perspective

Experience in the Netherlands

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  - Hydraulic engineering and Probabilistic design
    - Delft University of Technology
    - Ministry of Public Works

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Contents

- This will never happen again
- Design of flood protection
- New developments; more benefits
- Conclusions

Netherlands 1953

“This is not a matter of cost and benefit but of major national interest”

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New Orleans 2005

“We will engineer and build the most secure flood protection system the world has ever

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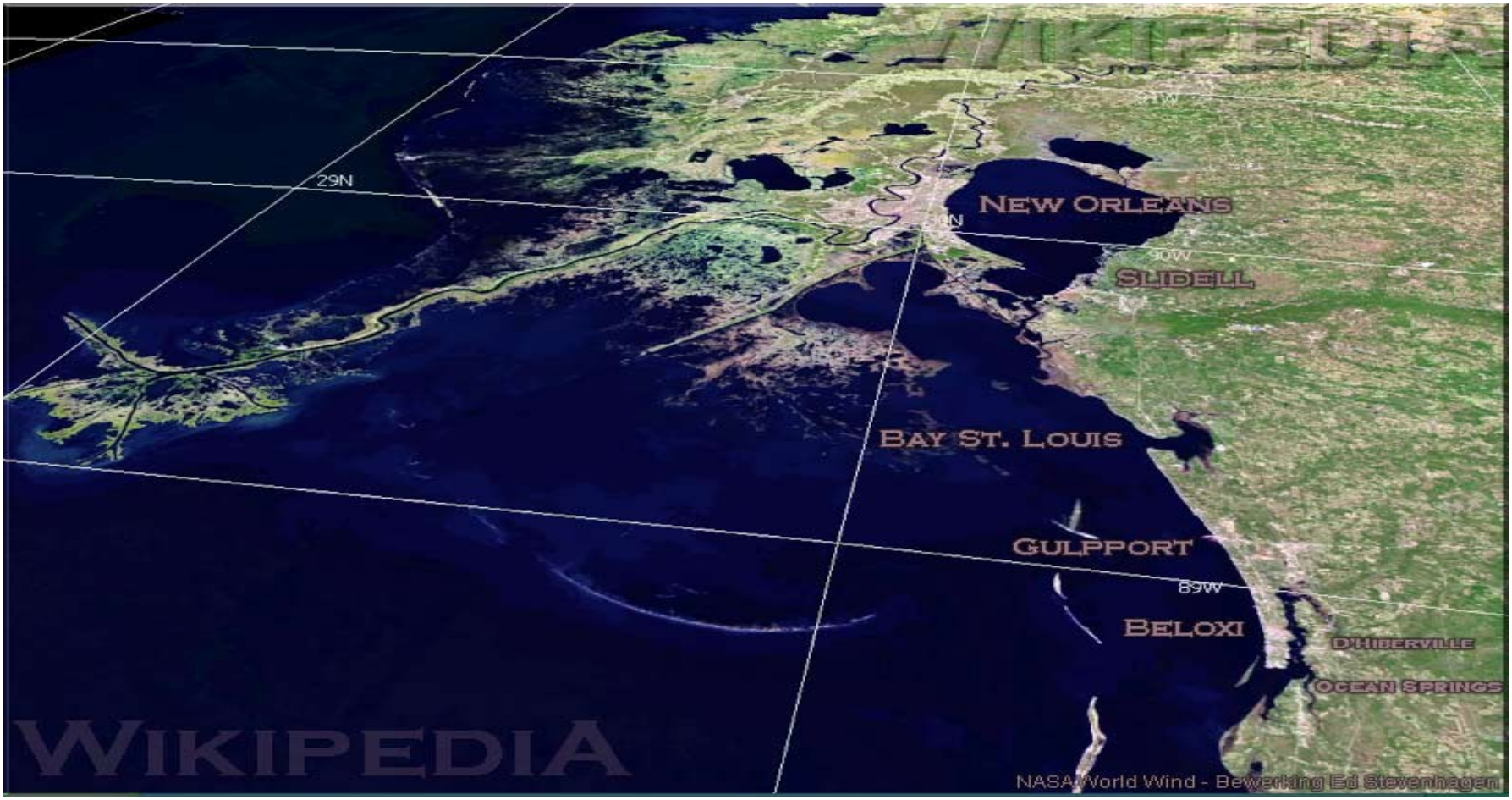
Design of flood protection

- A successful flood protection consists of two main systems:
  - Physical system
  - Social or management system
  - Both have to be designed, implemented and maintained

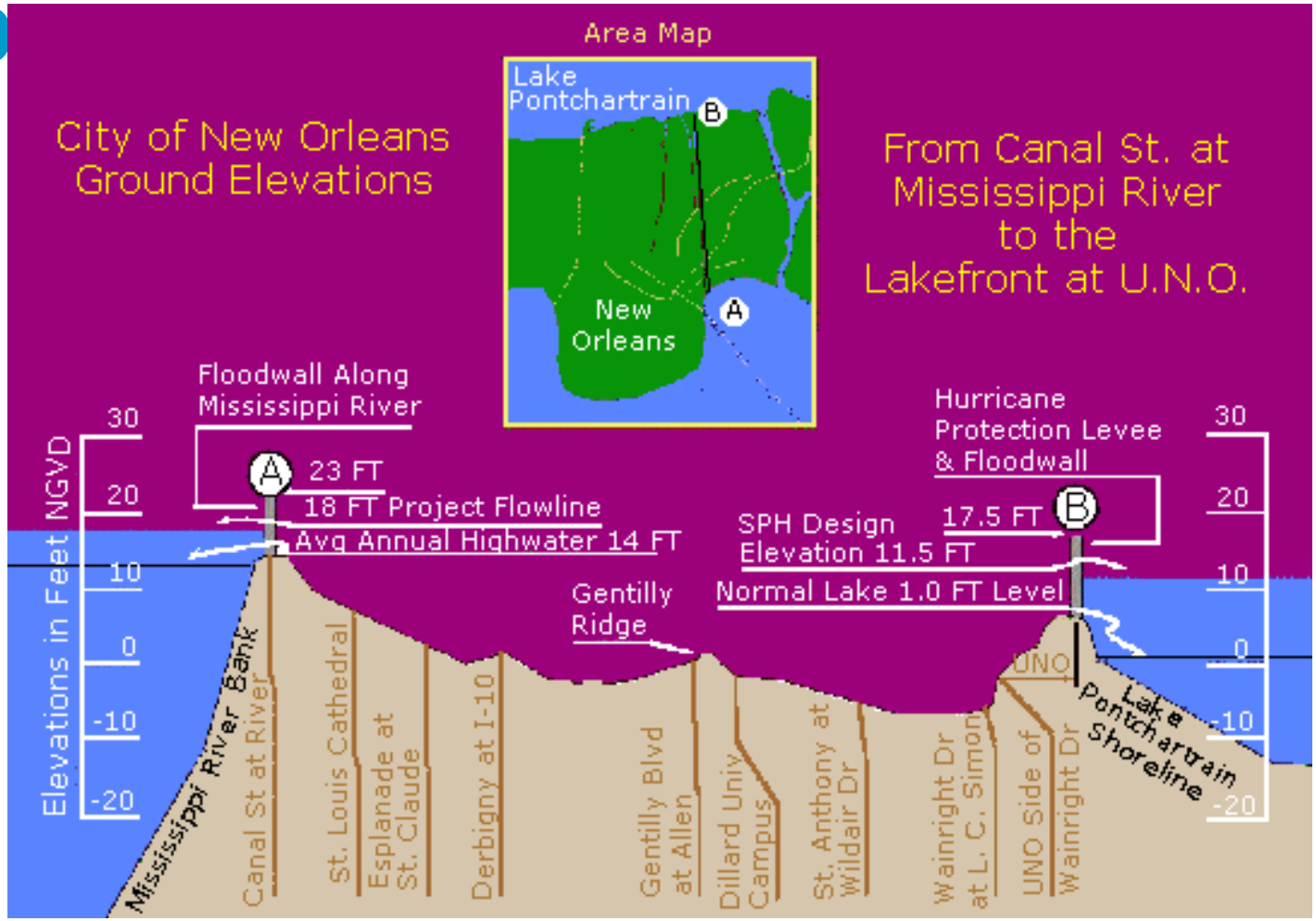
Design of flood protection

- The physical system contains:
  - Natural system: flow of water, sediment and species (flora and fauna)
  - Constructed system
    - dike rings
    - dams with locks and barriers
    - improvements of coast and river (multi-purpose)

Natural system of New Orleans



Constructed system of New O



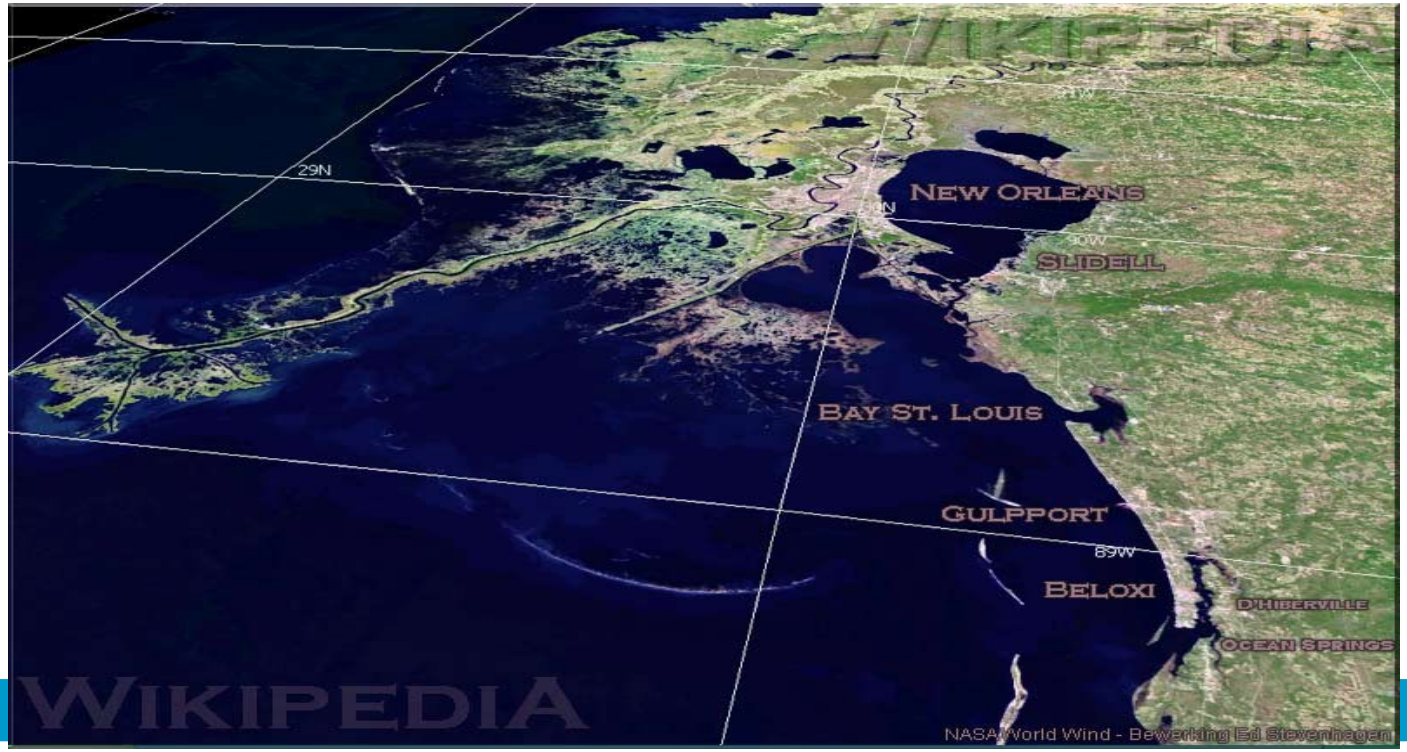
Design of flood protection
Physical system

1. threats by hurricane, river and rain
2. protection system (lay out & cross sections)
3. preserve and develop the environment
4. compare cost and benefits of alternatives (acceptable risk)

Design of flood protection
Physical system

1 threats:

hurricane (do not stop at cat. 5),
Mississippi,
rain



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Design of flood protection
Physical system
2 protection system (dike rings)

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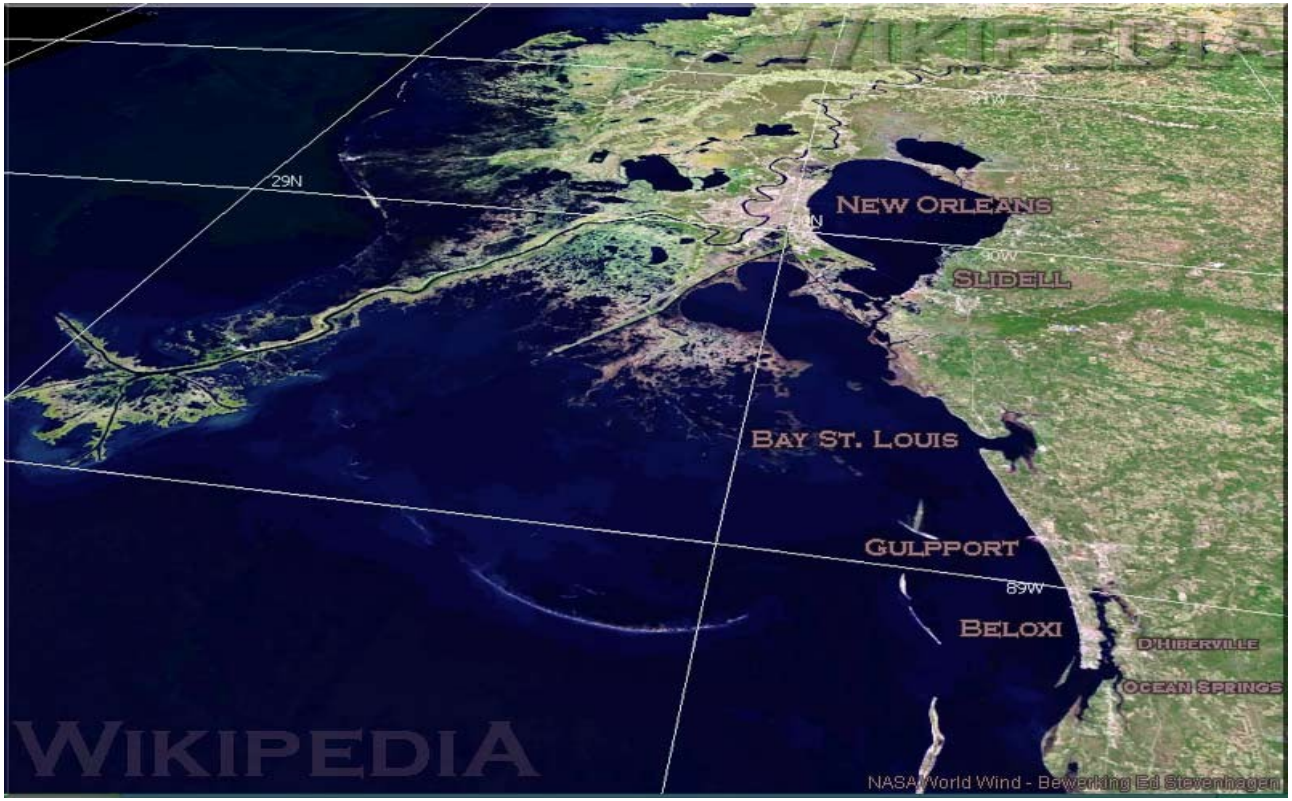
Design of flood protection
Physical system
2 protection system (dams, barriers)



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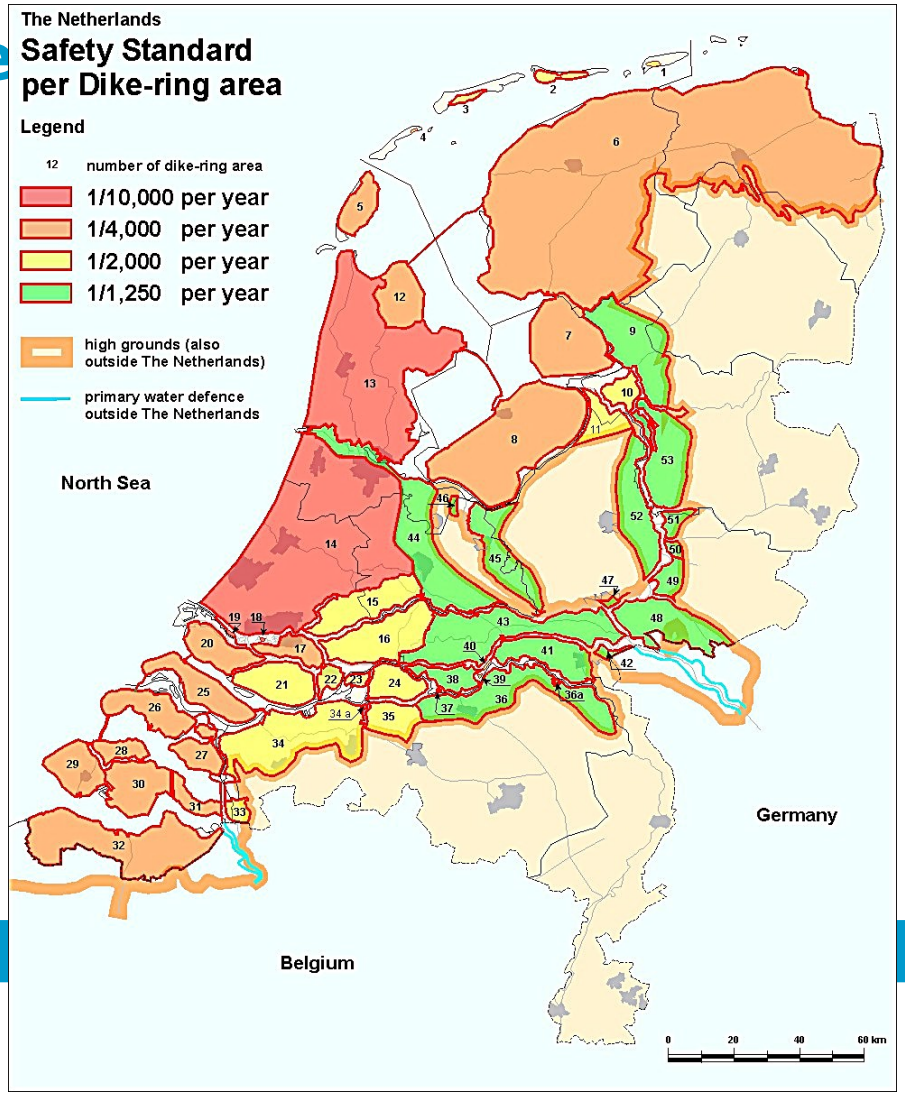
Protection system in the Netherlands

dike



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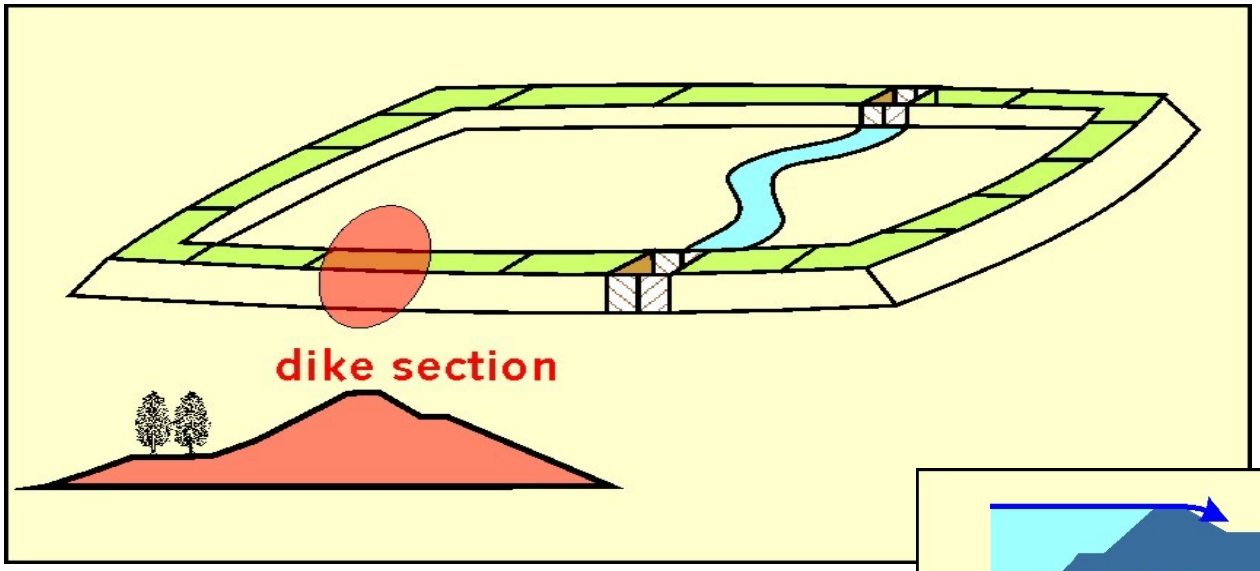
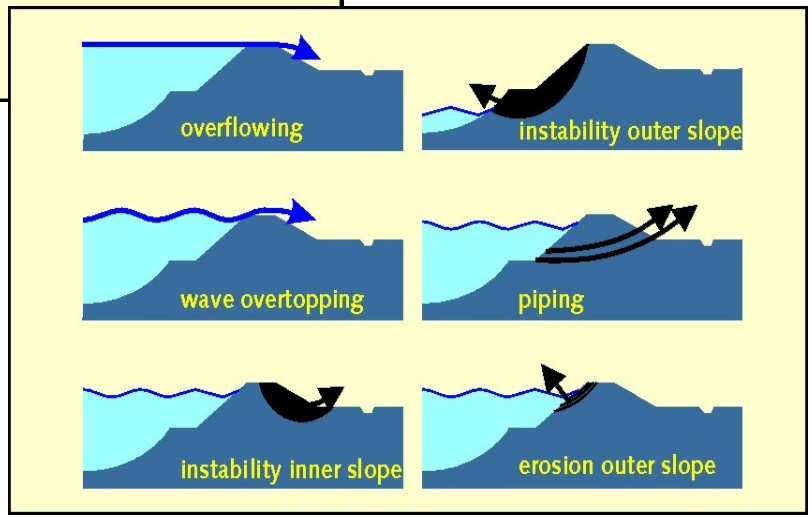
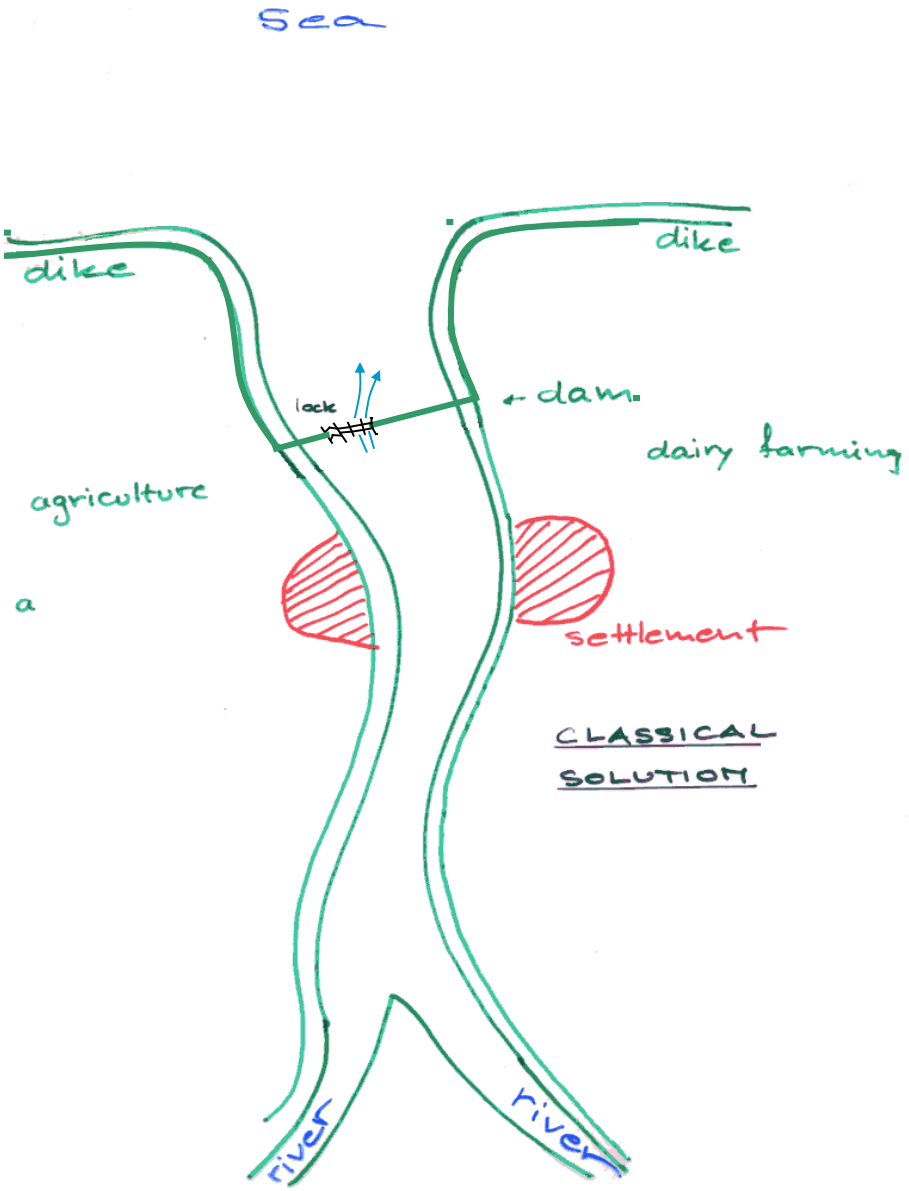
Design dike rings





Design closure dams



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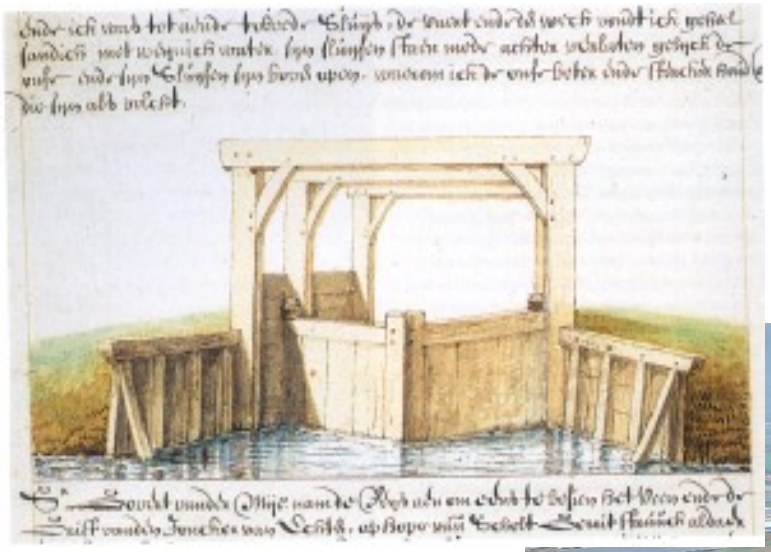
Closure dams and barriers

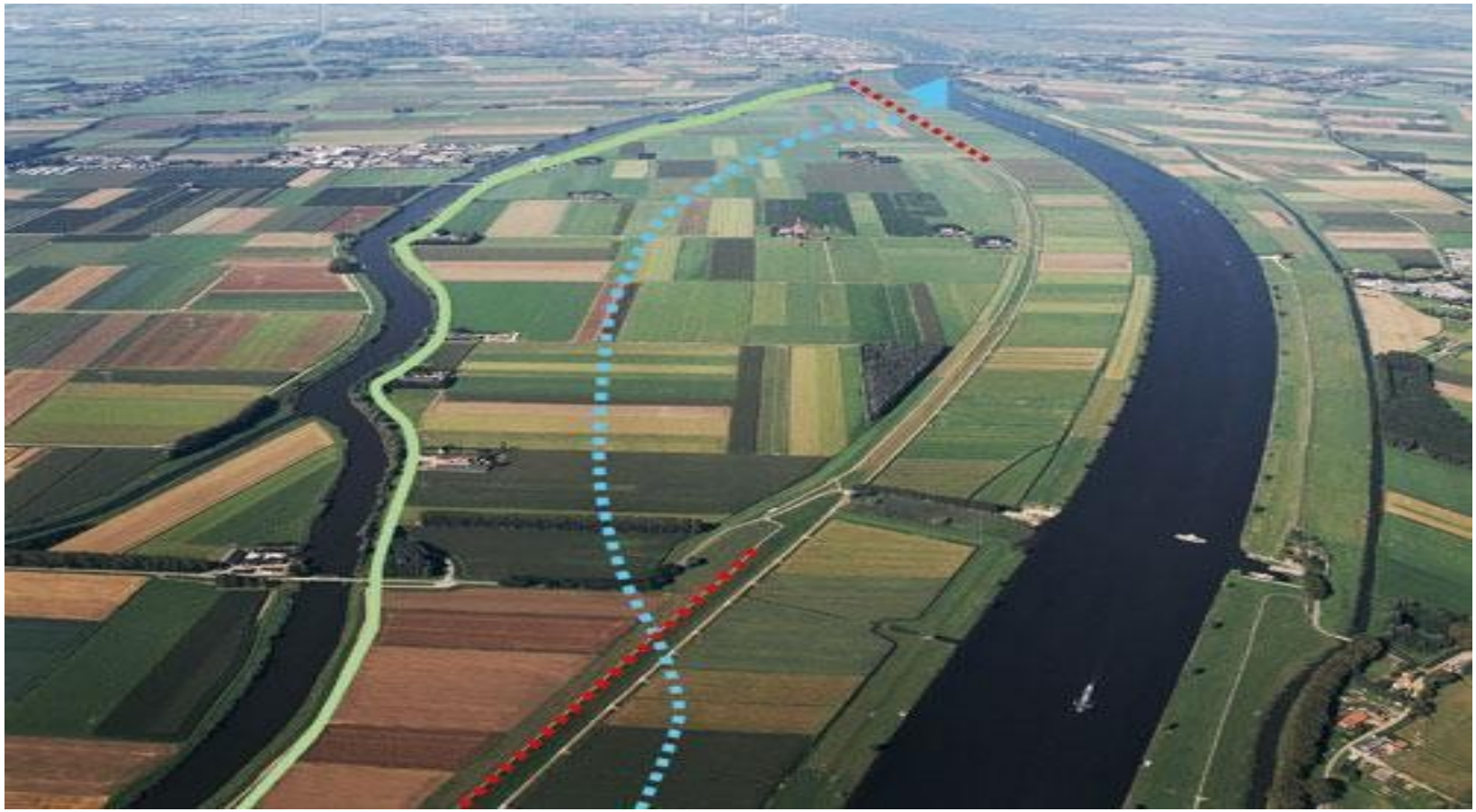


New developments : more benefits

- Look for more benefits
  - Coastal development with flood defence
  - Extra channels for nature development
  - Multifunctional flood defences to stimulate urban development

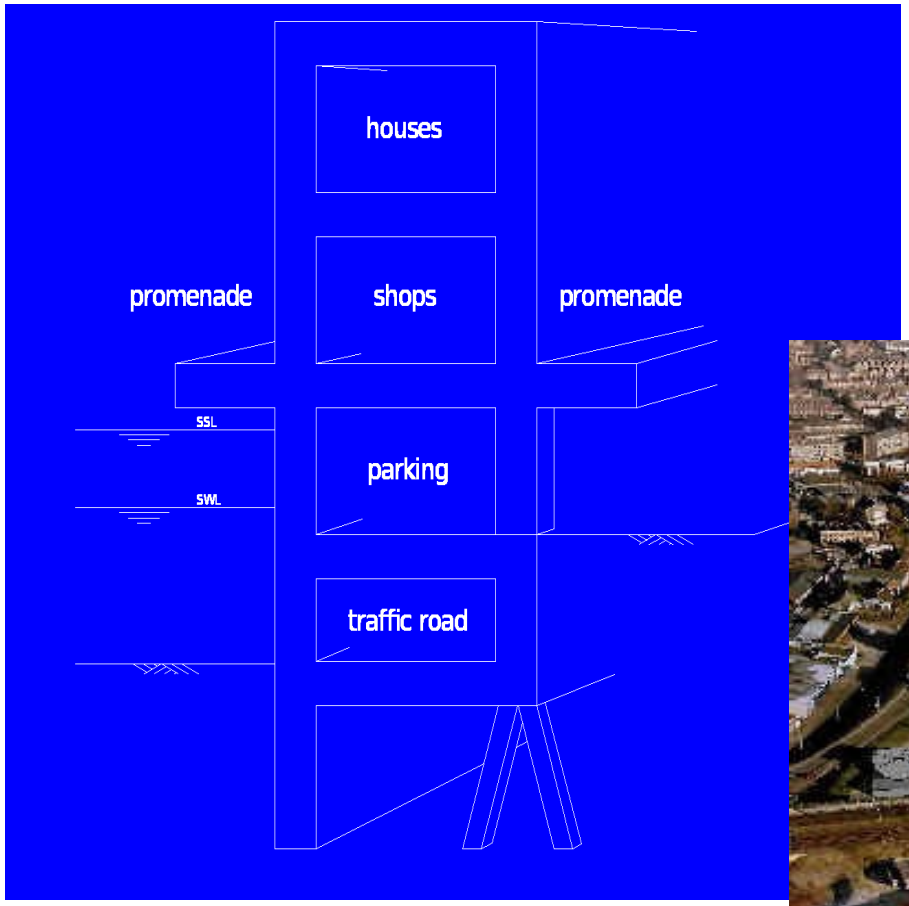
More benefits !

More benefits: enhancing the environment

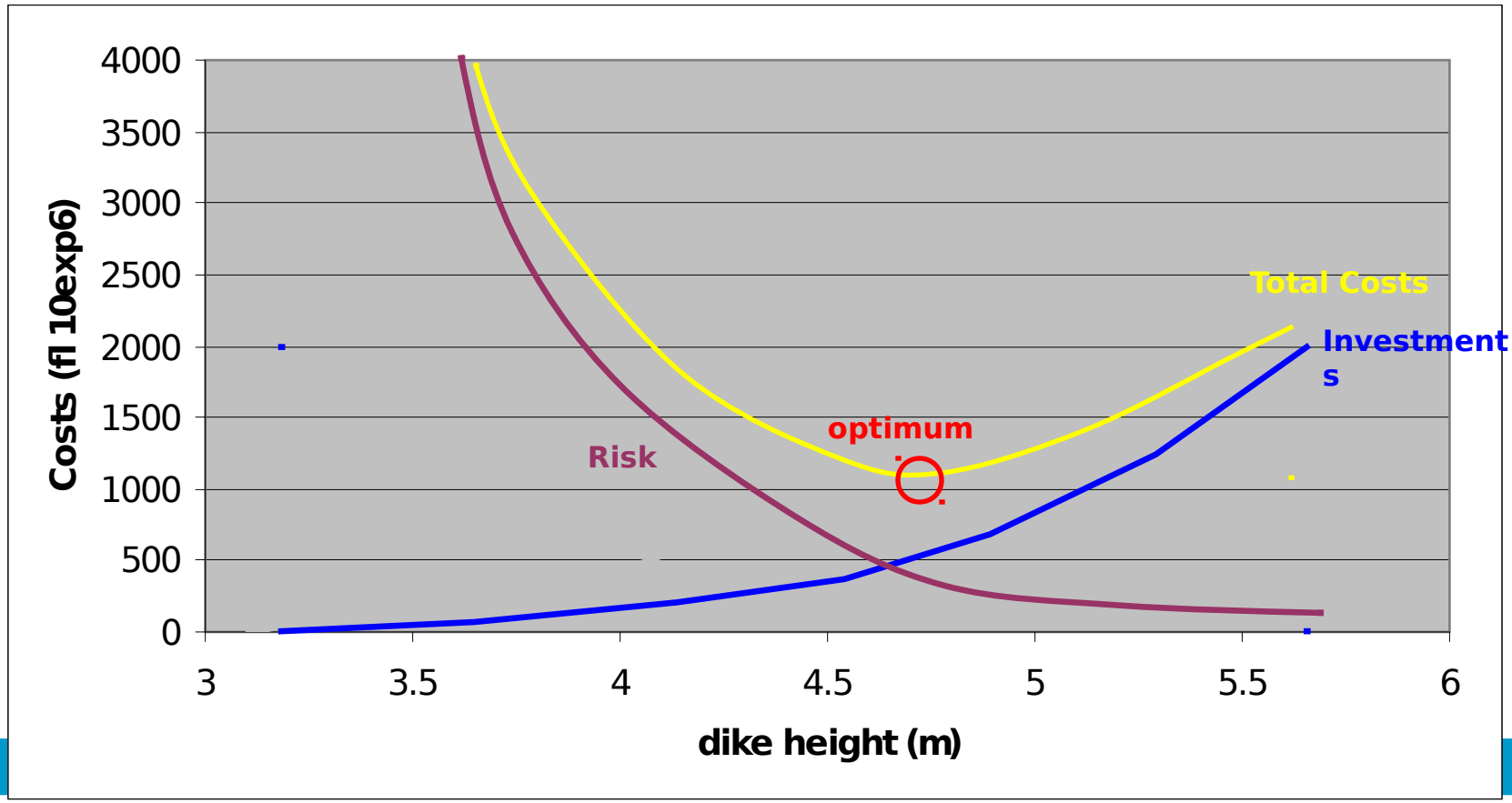


More benefits: living along a parallel river

More benefits : multiple use



Compare costs and benefits
Philosophy of Acceptable Risk



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Design of flood protection

- The social or management system contains:
  - professional system of people educated to understand of the physical system
  - the system of users and beneficiaries, that bears the costs
  - the political system that administrates

Design of flood protection

- the scale of the social/political system must equal the scale of the physical solutions
  - single government
  - single project organisation (zuiderzee and delta project)
- the professional system should reflect the needs of the users

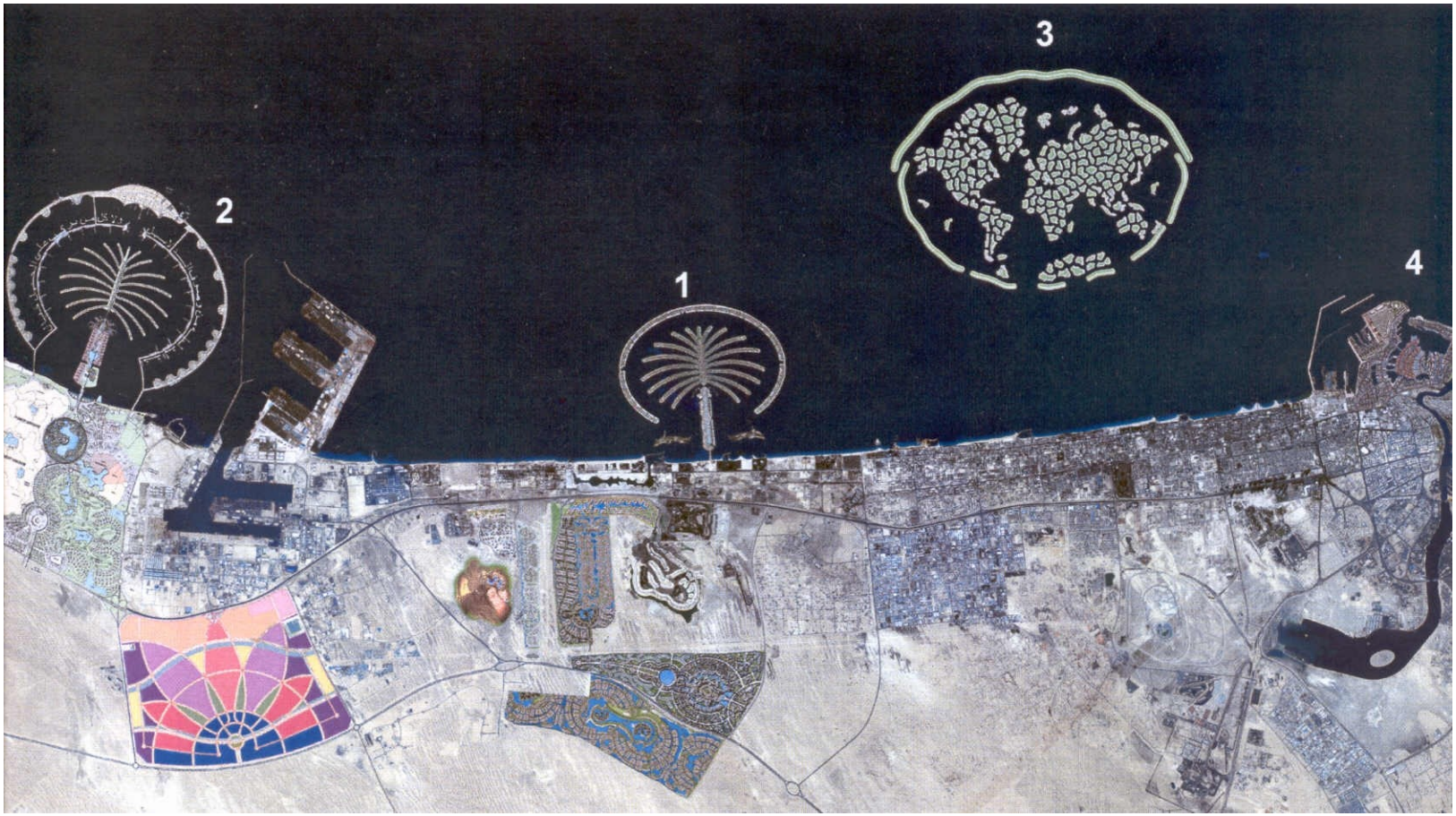
Conclusions

- A succesfull flood protection consists of two systems: the physical system and the social system: both have to be designed and maintained
- The physical flood protection is an integrated system of dike rings, dams & barriers and additional developments

Conclusions

- the scale of the social system must exceed the scale of the physical solutions
- employ the most efficient dredging companies of the world (Jones Act)

They can help you !



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